

CHECKING THE COMPLETENESS OF VALIDATED SAS PROGRAMS IN LSAF

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PHUSE EU Connect 2020



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AGENDA

- Background
- Process Outline
- Power of Jobs and Manifests
- Roles and Extended
- Examples



QC PROCESS REQUIREMENTS UPDATE

- Danone Nutricia Research migrated from SAS Enterprise Guide Environment to LSAF 4.7 in 2018*
- The old QC Process involved zipping programs, outputs, logs and QC programs at each QC iteration for each SAS program
- The current QC Process enables the reproducibility of each final versions of a program and document the different iterations of the QC Process
- Documenting that different iterations took place as well as ensuring reproducibility of the last and final iteration of the program, its execution and QC is enough
 - **Being able to reproduce results of each iteration of the QC process is NOT NECESSARY**
- Our proposal is to focus on:
 - **Traceability of the QC process**
 - **Ensuring reproducibility of the final iteration of the program ONLY**



Use of versioning and eSigning on selected items could enable this

*: DH04: "Implementing LSAF, The Danone Nutricia Journey" P. Vervuren & J.M. Ferran - PHUSE EU CONNECT 2019
Checking the completeness of validated SAS programs in LSAF, PHUSE EU CONNECT 2020



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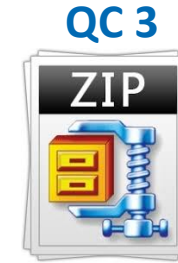
CURRENT



- SAS program, log , lst, Output
- QC program, log, lst
- *Input datasets*
- QC Report
- *Peer-review report*

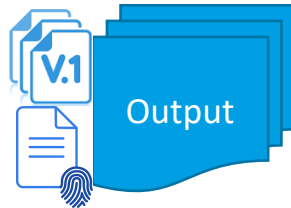


- SAS program, log , lst, Output
- QC program, log, lst
- *Input datasets*
- QC Report
- *Peer-review report*



- SAS program, log , lst, Output
- QC program, log, lst
- *Input datasets*
- QC Report
- *Peer-review report*

NEW



Tracking of Program Status using Versioning & eSignature

Traceability to used Macro in Job Manifest

Statistical Output eSigned by Peer-reviewer

Tracking of QC iterations

Issue Reporting in QC Report

eSigning of Peer-Review Report

FROM ZIPPING TO VERSIONING...

Checking the completeness of validated SAS programs in LSAF, PHUSE EU CONNECT 2020



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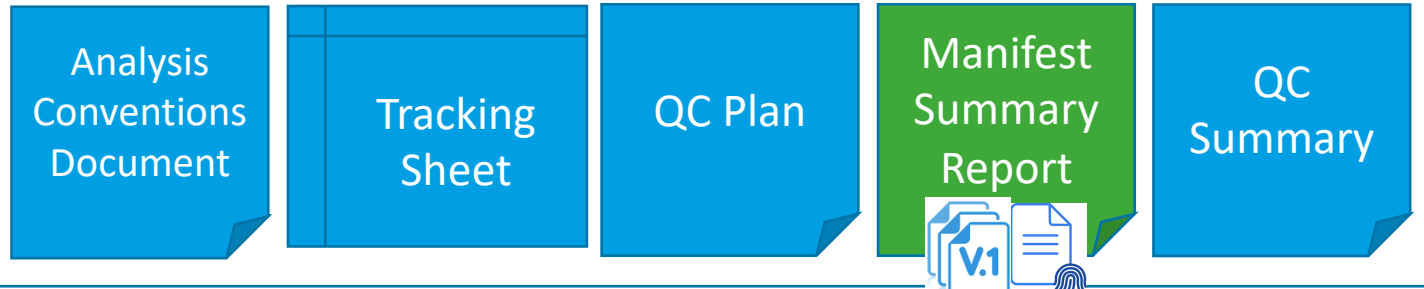
NUTRICIA RESEARCH

PROGRAM & ITS ARTEFACTS

WITH VERSIONING AND ESIGNING

- NEW PROCESS

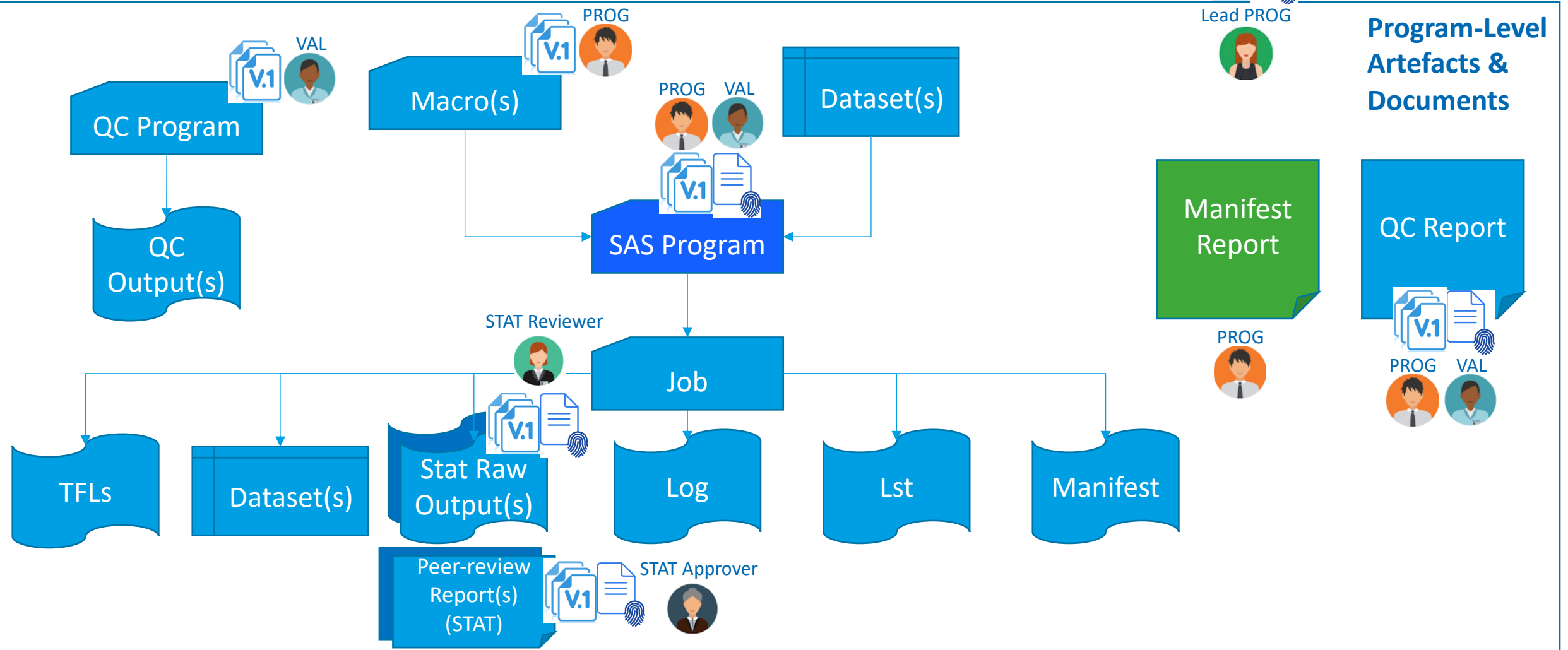
Milestone-Level Documents



Lead PROG



Program-Level Artefacts & Documents



VALIDATION MATRIX

Reason:	Approve
Role:	Basic QCer
Comment:	Approver Basic QCer Developer Extended QCer Minor Update

Level of QC for one version/Role	'Developer'	'Basic QCer'	'Extended QCer'	'Minor update'	Validated
Basic QC required	✓	✓	Na	Na	✓
Extended QC required	✓	✓	✓	Na	✓
Minor Update version					
Version x validated	✓	✓	✓	Na	✓
Version x + 0.1	Na	Na	Na	✓	✓

Basic QC Required: Developer and Basic QCer

Extended QC Required: Basic QC + Extended QCer

Minor update version, e.g. correction of a typo: only Minor QCer signature



SIGNING ROLES AND ADDITIONAL EXTENDED ATTRIBUTES ON PROGRAMS

Signing Role	Signing Role Description	Signed Item
Developer	The author of the program when program is ready for validation	Program
Basic QCer	Programmer conducting basic QC	Program
Extended QCer	Programmer conducting extended QC	Program
Statistical Reviewer	Statistician reviewing stat raw for program with statistical model	Raw Stat Output
Minor Update	Author fixing a minor issue after basic and/or extended QC have taken place	Program
Statistical Approver	Statistician reviewing the Peer-review report	Peer-review report

Extended Attributes on Programs	Type
Does the program require extended QC?	Boolean
Does the program/outputs require Statistical Review?	Boolean



THE POWER OF THE JOBS AND THEIR MANIFESTS

INPUTS AND OUTPUTS ARE LISTED WITH THEIR VERSION IN THE JOB MANIFEST OF A GIVEN JOB EXECUTION

job_test1 *

Text to filter

Name	Location	Version	Referenced SAS Program
dataset1.sas7bdat	/SAS/999 Prototype QC/Files/60 Study Report/41 ADaM Data	-	/SAS/999 Prototype QC/Files/60 Study Report/50 Output Programs/test1.sas
dataset2.sas7bdat	/SAS/999 Prototype QC/Files/60 Study Report/41 ADaM Data	-	/SAS/999 Prototype QC/Files/60 Study Report/50 Output Programs/test1.sas
macro1.sas	/SAS/999 Prototype QC/Files/60 Study Report/01 Macros	1.0	/SAS/999 Prototype QC/Files/60 Study Report/50 Output Programs/test1.sas
macro2.sas	/SAS/999 Prototype QC/Files/60 Study Report/01 Macros	1.0	/SAS/999 Prototype QC/Files/60 Study Report/50 Output Programs/test1.sas

job_test1 *

Text to filter

Versioning was enabled on all new output files.
Major versions were applied to all output files.

Name ▲	Location	Version	Referenced SAS Program
job_test1.log	/SAS/999 Prototype QC/Files/60 Study Report/50 Output Programs/Log	4.0	
job_test1.lst	/SAS/999 Prototype QC/Files/60 Study Report/50 Output Programs/Listing	4.0	
output1.pdf	/SAS/999 Prototype QC/Files/60 Study Report/55 Output Results/01 PDF	4.0	/SAS/999 Prototype QC/Files/60 Study Report/50 Output Programs/test1.sas

Full Traceability of the final version of the program is documented in the job manifest

Checking the completeness of validated SAS programs in LSAF, PHUSE EU CONNECT 2020



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THE POWER OF JOBS AND THEIR MANIFESTS

EACH EXECUTION IS REGISTERED IN THE PUBLISH HISTORY OF THE JOB

job_test1 [read-only] *

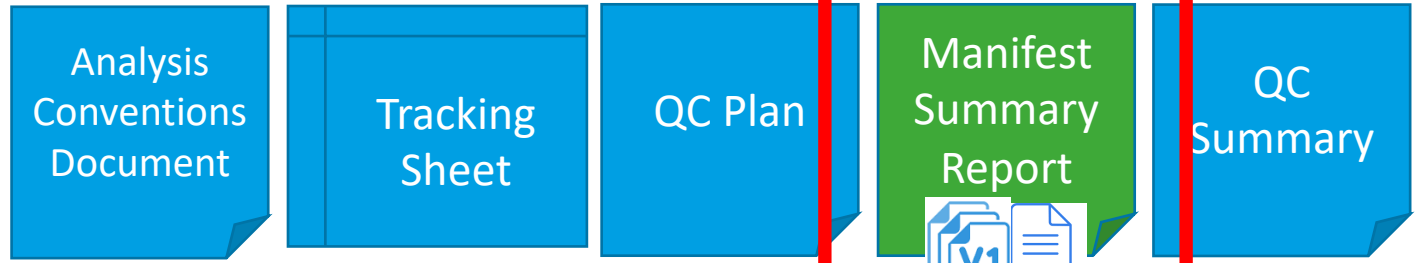
Status	Date Submitted	Version	Run-as User	Submitted By	Date Completed	Run Information
✓	Nov 08, 2019 11:59 AM	-	Jean-Marc Ferran	Jean-Marc Ferran	Nov 08, 2019 11:59 AM	Job completed successfully.
✓	Mar 19, 2019 03:38 PM	-	uat_pg_01	uat_pg_01	Mar 19, 2019 03:38 PM	Job completed successfully.
✓	Mar 19, 2019 03:36 PM	-	uat_pg_01	uat_pg_01	Mar 19, 2019 03:36 PM	Job completed successfully.
✓	Mar 19, 2019 03:35 PM	-	uat_pg_01	uat_pg_01	Mar 19, 2019 03:35 PM	Job completed successfully.

PROGRAM & ITS ARTEFACTS

WITH VERSIONING AND ESIGNING

- NEW PROCESS

Milestone-Level Documents



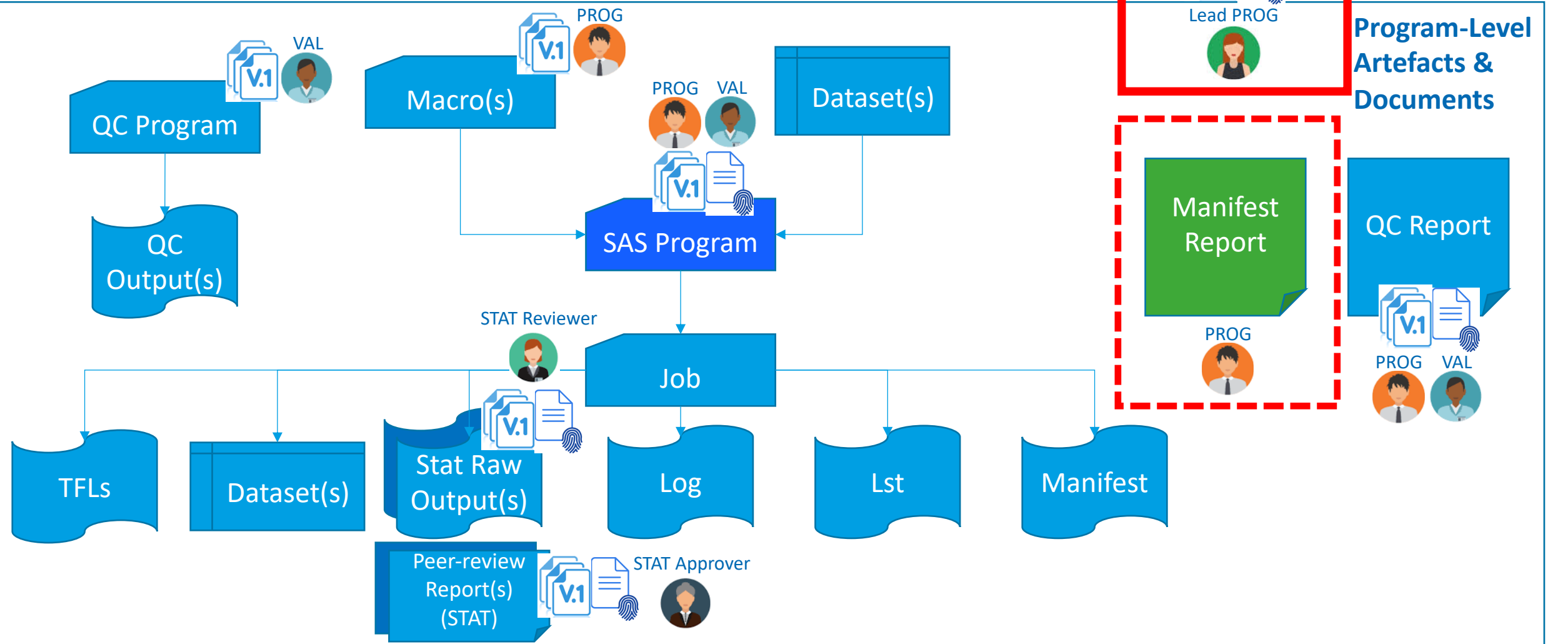
Lead PROG



Program-Level Artefacts & Documents



PROG



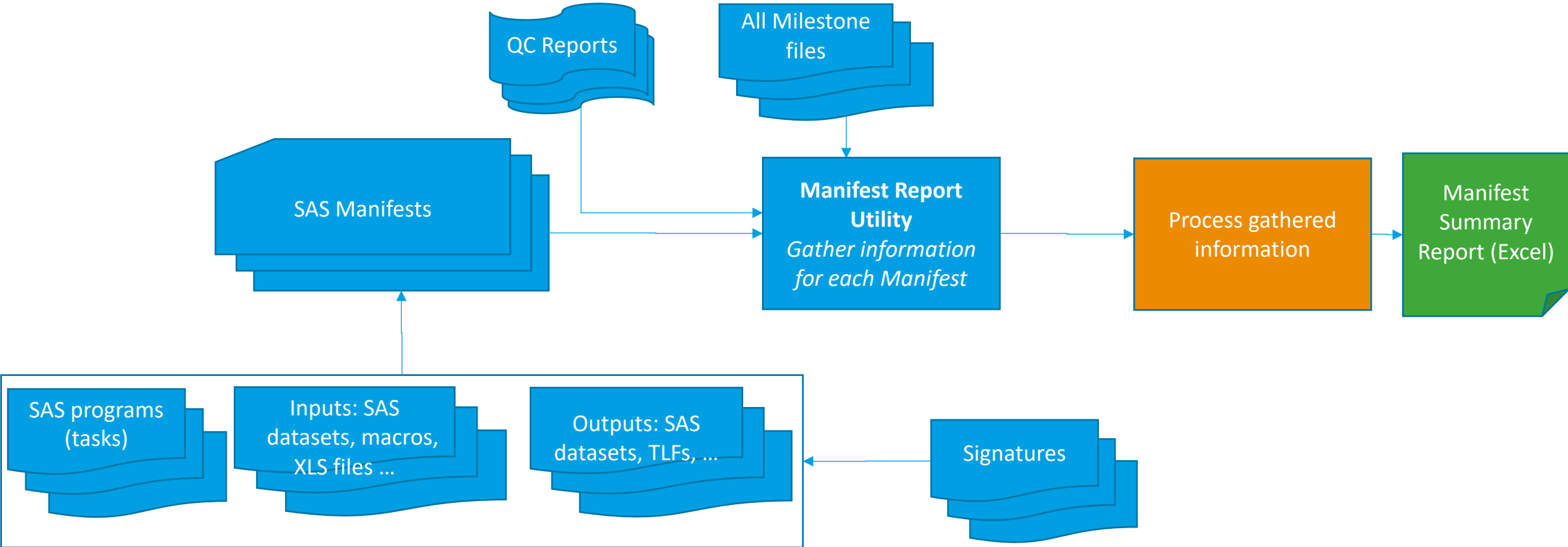
STAT Reviewer



STAT Approver



FLOW CHART SUMMARY MANIFEST REPORT



QC SUMMARY REPORT (1)

- QC Summary -> one row per job
- Summarizing
 - Validation status of program
 - Any issues
 - E-signatures
- Comment field for Program Lead

Comment *	Status
	Approv
	Approv
	Approv
	Approv
	Approv
	Approv

Manifest	File name	Comment *	Status	Issue	Folder	Developer Sign.	Basic QC Sign.	Rev
50 Output Programs/F01_Compound_x_Subjects.mnf	F01_Compound_x_Subjects.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:33, Vers. 1	Approve: user_1, 19MAR20:17:11:05, Vers. 1	App
50 Output Programs/F02_Compound_x_Products.mnf	F02_Compound_x_Products.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:31, Vers. 1	Approve: user_1, 19MAR20:17:11:06, Vers. 1	App
50 Output Programs/F03_Compound_x_Mean.mnf	F03_Compound_x_Mean.sas		Approved	No issues	50 Output Programs	Approve: user_1, 16APR20:07:27:40, Vers. 1.1	Approve: user_1, 16APR20:07:28:02, Vers. 1.1	App
50 Output Programs/F04_AbcXyZ_Products.mnf	F04_AbcXyZ_Products.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:29, Vers. 1	Approve: user_1, 19MAR20:17:11:08, Vers. 1	App
50 Output Programs/F05_AbcXyZ_Mean.mnf	F05_AbcXyZ_Mean.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:28, Vers. 1	Approve: user_1, 19MAR20:17:11:09, Vers. 1	App
50 Output Programs/F06_AbcXyZ_PK_Bar.mnf	F06_AbcXyZ_PK_Bar.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:27, Vers. 1	Approve: user_1, 19MAR20:17:11:10, Vers. 1	App
50 Output Programs/F07_AbcXyZ_T20_Bar.mnf	F07_AbcXyZ_T20_Bar.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:26, Vers. 1	Approve: user_1, 19MAR20:17:11:11, Vers. 1	App
50 Output Programs/F08_AbcXyZ_Box.mnf	F08_AbcXyZ_Box.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:24, Vers. 1	Approve: user_1, 19MAR20:17:11:13, Vers. 1	App
50 Output Programs/F09_Any_Bar.mnf	F09_Any_Bar.sas		Approved	No issues	50 Output Programs	Approve: user_1, 16APR20:07:27:40, Vers. 1.2	Approve: user_1, 16APR20:07:28:03, Vers. 1.2	App
50 Output Programs/F10_GL_Bar.mnf	F10_GL_Bar.sas		Approved	No issues	50 Output Programs	Approve: user_1, 16APR20:07:27:40, Vers. 1.2	Approve: user_1, 16APR20:07:28:03, Vers. 1.2	App
50 Output Programs/F11_Any_GL_AUC_Box.mnf	F11_Any_GL_AUC_Box.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:21, Vers. 1	Approve: user_1, 19MAR20:17:11:18, Vers. 1	App
50 Output Programs/F12_Compound_x_PK_Bar.mnf	F12_Compound_x_PK_Bar.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:20, Vers. 1	Approve: user_1, 19MAR20:17:11:19, Vers. 1	App
50 Output Programs/F13_Compound_x_Spaghetti.mnf	F13_Compound_x_Spaghetti.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:17:10:18, Vers. 1	Approve: user_1, 19MAR20:17:11:20, Vers. 1	App
50 Output Programs/L1_Demographics.mnf	L1_Demographics.sas		Approved	No issues	50 Output Programs	Approve: user_1, 18MAR20:16:08:53, Vers. 1	Approve: user_1, 18MAR20:16:09:15, Vers. 1	App
50 Output Programs/L2_Compound_x_Individual.mnf	L2_Compound_x_Individual.sas		Approved	No issues	50 Output Programs	Approve: user_1, 18MAR20:16:08:53, Vers. 1	Approve: user_1, 18MAR20:16:09:16, Vers. 1	App
50 Output Programs/L3_Compound_x_PK.mnf	L3_Compound_x_PK.sas		Approved	No issues	50 Output Programs	Approve: user_1, 18MAR20:16:08:52, Vers. 1	Approve: user_1, 18MAR20:16:09:16, Vers. 1	App
50 Output Programs/L4_Any_GL.mnf	L4_Any_GL.sas		Approved	No issues	50 Output Programs	Approve: user_1, 18MAR20:16:08:52, Vers. 1	Approve: user_1, 18MAR20:16:09:16, Vers. 1	App
50 Output Programs/L5_AbcXyZ_Individual.mnf	L5_AbcXyZ_Individual.sas		Approved	No issues	50 Output Programs	Approve: user_1, 18MAR20:16:08:52, Vers. 1	Approve: user_1, 18MAR20:16:09:16, Vers. 1	App
50 Output Programs/L6_AbcXyZ_PK.mnf	L6_AbcXyZ_PK.sas		Approved	No issues	50 Output Programs	Approve: user_1, 18MAR20:16:08:52, Vers. 1	Approve: user_1, 18MAR20:16:09:16, Vers. 1	App
50 Output Programs/L7_EarlyTerminations.mnf	L7_EarlyTerminations.sas		Approved	No issues	50 Output Programs	Approve: user_1, 18MAR20:16:08:52, Vers. 1	Approve: user_1, 18MAR20:16:09:16, Vers. 1	App
50 Output Programs/T01_Demographics.mnf	T01_Demographics.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:06:41:38, Vers. 1	Approve: user_2, 19MAR20:13:49:37, Vers. 1	App
50 Output Programs/T02_Compound_x_Baseline.mnf	T02_Compound_x_Baseline.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:06:41:38, Vers. 1	Approve: user_2, 19MAR20:13:49:37, Vers. 1	App
50 Output Programs/T03_Compound_x_Descriptives.mnf	T03_Compound_x_Descriptives.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:06:41:38, Vers. 1	Approve: user_2, 19MAR20:13:49:37, Vers. 1	App
50 Output Programs/T04_AbcXyZ_TimePoints.mnf	T04_AbcXyZ_TimePoints.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:06:41:37, Vers. 1	Approve: user_2, 19MAR20:13:49:37, Vers. 1	App
50 Output Programs/T05_AbcXyZ_PK.mnf	T05_AbcXyZ_PK.sas		Approved	No issues	50 Output Programs	Approve: user_1, 19MAR20:06:41:37, Vers. 1	Approve: user_2, 19MAR20:13:49:37, Vers. 1	App



QC SUMMARY REPORT (2)

- High level overview

Manifest	Task Status	Comma	Sheet	Issue type	Issue
40 ADaMProgramfAdcm.mnf	Approved		All Sheets	No Issues	All files
40 ADaMProgramfAdlb.mnf	Approved		All Sheets	No Issues	All files
40 ADaMProgramfAdlh.mnf	Approved		All Sheets	No Issues	All files
40 ADaMProgramfAdlg.mnf	Approved		All Sheets	No Issues	All files
40 ADaMProgramfAdlmmnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL1_SAF_Demographic.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL2_SAF_MH.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL3_SAF_ML.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL4_SAF_CM.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL5_SAF_CMurAE.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL6_SAF_AE.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL6_SAF_SAE.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCL7_SAF_ET.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT01_SAF_MH.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT02_SAF_CM.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT03_SAF_AE_Cat.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT04_SAF_AE_Num.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT05_SAF_AE_SOC_PT.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT06_SAF_AE_Severity.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT07_SAF_AE_Recade4Relation.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT08_SAF_AE_Relation.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT09_SAF_SAE_SOC_PT.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT10_SAF_SAE_Recade4Relation.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfCT11_SAF_ET.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfF01_Compound_x_Subjectr.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfF02_Compound_x_Productr.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfF03_Compound_x_Mean.mnf	Approved		All Sheets	No Issues	All files
50 OutputProgramfF04_Atchly2_Productr.mnf	Approved		All Sheets	No Issues	All files

- Example Consistency
 - File Modified after date of manifest

Sheet	Issue type	Issue
INPUT	Modified Date	Modified date file after modified date of Manifest: 19MAR2020:21:16:48

Filename	File size	Datetime modified
adqs.sas7bdat	737,280	06Aug2020:10:27:46

Input

QC SUMMARY REPORT (3)

- QC Report
 - Date of QC Docx Report
 - Date of Program file
 - Date of Minor update, e.g. typo update

Manifest	QC Report	Task file	Status	Date QC Report file	Date task file	Date of Minor Update
50 Output Programs/F09_Any_Bar.mnf	QC_F09_Any_Bar.docx	F09_Any_Bar.sas	Approved	16Apr2020:07:28:46	15Apr2020:14:32:26	
50 Output Programs/F10_GL_Bar.mnf	QC_F10_GL_Bar.docx	F10_GL_Bar.sas	Approved	16Apr2020:07:28:46	15Apr2020:14:32:27	
50 Output Programs/F11_Any_GL_AUC_Box.mnf	QC_F11_Any_GL_AUC_Box.docx	F11_Any_GL_AUC_Box.sas	Approved	19Mar2020:17:12:42	19Mar2020:07:09:59	
50 Output Programs/F12_Compound x_PK_Bar.mnf	QC_F12_Compound x_PK_Bar.docx	F12_Compound x_PK_Bar.sas	Approved	19Mar2020:17:12:43	18Mar2020:13:12:25	
50 Output Programs/F13_Compound x_Spaghetti.mnf	QC_F13_Compound x_Spaghetti.docx	F13_Compound x_Spaghetti.sas	Approved	19Mar2020:17:12:44	18Mar2020:13:12:25	
50 Output Programs/L1_Demographics.mnf	QC_L1_Demographics.docx	L1_Demographics.sas	Approved	30Mar2020:15:42:02	17Mar2020:11:15:38	
50 Output Programs/L2_Compound x_Individual.mnf	QC_L2_Compound x_Individual.docx	L2_Compound x_Individual.sas	Approved	30Mar2020:15:42:02	18Mar2020:15:07:15	
50 Output Programs/L3_Compound x_PK.mnf	QC_L3_Compound x_PK.docx	L3_Compound x_PK.sas	Approved	30Mar2020:15:42:02	18Mar2020:15:24:34	
50 Output Programs/L4_Any_GL.mnf	QC_L4_Any_GL.docx	L4_Any_GL.sas	Approved	30Mar2020:15:42:02	17Mar2020:11:15:39	
50 Output Programs/L5_AbcXyZ_Individual.mnf	QC_L5_AbcXyZ_Individual.docx	L5_AbcXyZ_Individual.sas	Approved	30Mar2020:15:42:03	17Mar2020:11:15:39	
50 Output Programs/L6_AbcXyZ_PK.mnf	QC_L6_AbcXyZ_PK.docx	L6_AbcXyZ_PK.sas	Approved	30Mar2020:15:42:03	17Mar2020:11:15:39	
50 Output Programs/L7_EarlyTerminations.mnf	QC_L7_EarlyTerminations.docx	L7_EarlyTerminations.sas	Approved	30Mar2020:15:42:03	17Mar2020:11:15:39	
50 Output Programs/T01_Demographics.mnf	QC_T01_Demographics.docx	T01_Demographics.sas	Approved	19Mar2020:14:13:12	17Mar2020:11:15:39	
50 Output Programs/T02_Compound x_Baseline.mnf	QC_T02_Compound x_Baseline.docx	T02_Compound x_Baseline.sas	Approved	19Mar2020:14:13:12	17Mar2020:11:15:39	
50 Output Programs/T03_Compound x_Descriptives.mnf	QC_T03_Compound x_Descriptives.docx	T03_Compound x_Descriptives.sas	Approved	19Mar2020:14:13:12	17Mar2020:11:15:40	
50 Output Programs/T04_AbcXyZ_TimePoints.mnf	QC_T04_AbcXyZ_TimePoints.docx	T04_AbcXyZ_TimePoints.sas	Approved	19Mar2020:14:13:12	17Mar2020:11:15:40	
50 Output Programs/T05_AbcXyZ_PK.mnf	QC_T05_AbcXyZ_PK.docx	T05_AbcXyZ_PK.sas	Approved	19Mar2020:14:13:12	17Mar2020:11:15:40	
50 Output Programs/T06_Compliance.mnf	QC_T06_Compliance.docx	T06_Compliance.sas	Approved	19Mar2020:14:13:12	17Mar2020:11:15:40	
50 Output Programs/T07_GL.mnf	QC_T07_GL.docx	T07_GL.sas	Approved	19Mar2020:07:56:29	19Mar2020:07:31:18	
50 Output Programs/T08_GL.mnf	QC_T08_GL.docx	T08_GL.sas	Approved	16Apr2020:07:28:46	15Apr2020:14:17:31	
50 Output Programs/T09_Analyses.mnf	QC_T09_Analyses.docx	T09_Analyses.sas	Approved	26Mar2020:16:27:05	30Mar2020:05:30:39	20Apr20:08:16:03
50 Output Programs/T09_Analyses_Tmax.mnf	QC_T09_Analyses_Tmax.docx	T09_Analyses_Tmax.sas	Approved	30Mar2020:15:39:49	30Mar2020:15:23:21	

QC Summary | Summary | **QC Report** | Manifest | Job | E-Signatures | Task(s) | Input | Output | Input Other | Log-Listing | Checklog | Param



E-SIGNATURES

- Chronological order of all e-signatures of all versions
- Comments added to the signatures
- Final version colored green or red

1	19MAR20:17:10:30	user_1	Publisher	Approve	Ready for QC
1	19MAR20:17:11:07	user_2	Statistical Programmer	Approve	Basic QC done
1	19MAR20:17:11:52	user_3	Reviewer	Reject	Missing time-point
1.1	16APR20:07:27:40	user_1	Publisher	Approve	Ready for QC
1.1	16APR20:07:28:02	user_2	Statistical Programmer	Approve	Basic QC done
1.1	16APR20:07:28:22	user_3	Reviewer	Approve	QC done

Manifest	Source	File name	File in this Manifest	Version Number	E-signed	User ID	Role associated with signature	Reason for signature	Comment entered at time
50 Output Programs/T07_GI.mnf	TASK # 1	T07_GI.sas		1.1	19MAR20:06:41:36	user_1	Publisher	Approve	Ready for QC
50 Output Programs/T07_GI.mnf	TASK # 1	T07_GI.sas	Y	1.2	19MAR20:07:31:41	user_1	Publisher	Approve	Ready for QC
50 Output Programs/T07_GI.mnf	TASK # 1	T07_GI.sas	Y	1.2	19MAR20:07:50:24	user_1	Statistical Programmer	Approve	Basic QC done
50 Output Programs/T07_GI.mnf	TASK # 1	T07_GI.sas	Y	1.2	19MAR20:07:51:37	user_2	Reviewer	Approve	
50 Output Programs/T08_GL.mnf	TASK # 1	T08_GL.sas		1	18MAR20:13:22:51	user_1	Publisher	Approve	Ready for QC
50 Output Programs/T08_GL.mnf	TASK # 1	T08_GL.sas		1	19MAR20:06:44:12	user_2	Statistical Programmer	Approve	
50 Output Programs/T08_GL.mnf	TASK # 1	T08_GL.sas		1	19MAR20:06:44:34	user_3	Reviewer	Reject	Mean at Visit 1
50 Output Programs/T08_GL.mnf	TASK # 1	T08_GL.sas	Y	1.1	16APR20:07:27:40	user_1	Publisher	Approve	Ready for QC
50 Output Programs/T08_GL.mnf	TASK # 1	T08_GL.sas	Y	1.1	16APR20:07:28:03	user_2	Statistical Programmer	Approve	Basic QC done
50 Output Programs/T08_GL.mnf	TASK # 1	T08_GL.sas	Y	1.1	16APR20:07:28:22	user_3	Reviewer	Approve	QC done
50 Output Programs/T09_Analyses.mnf	TASK # 1	T09_Analyses.sas		1	26MAR20:16:21:39	user_1	Publisher	Approve	Ready for QC
50 Output Programs/T09_Analyses.mnf	TASK # 1	T09_Analyses.sas		1	26MAR20:16:22:00	user_2	Statistical Programmer	Approve	Basic QC done
50 Output Programs/T09_Analyses.mnf	TASK # 1	T09_Analyses.sas		1	26MAR20:16:22:18	user_3	Reviewer	Approve	QC done
50 Output Programs/T09_Analyses.mnf	TASK # 1	T09_Analyses.sas	Y	1.1	20APR20:08:16:03	user_1	Approver	Approve	Typo title corrected

1	26MAR20:16:21:39	user_1	Publisher	Approve	Ready for QC
1	26MAR20:16:22:00	user_2	Statistical Programmer	Approve	Basic QC done
1	26MAR20:16:22:18	user_3	Reviewer	Approve	QC done
1.1	20APR20:08:16:03	user_1	Approver	Approve	Typo title corrected



CHECK LOG

- Checklog
 - All Errors
 - All Warnings
 - Including relevant NOTES and INFO lines like uninitialized variables, converting character to numeric or vice versa

	Line #	Issue
nd_x_PK.log		### No issues to be reported
og		### No issues to be reported
ndividual.log		### No issues to be reported
PK.log		### No issues to be reported
inations.log		### No issues to be reported
phics.log	1173	NOTE: The file WORK.__COMPL: (memtype=DATA) was not found, but appears on a DELETE statement.
phics.log	2747	NOTE: The file WORK.__COMPL: (memtype=DATA) was not found, but appears on a DELETE statement.
nd_x_Baseline.log		### No issues to be reported
nd_x_Descriptives.log		### No issues to be reported
TimePoints.log		### No issues to be reported
PK.log		### No issues to be reported

QC Summary | Summary | QC Report | Manifest | Job | E-Signatures | Task(s) | Input | Output | Input Other | Log-Listing | **Checklog** | Parameters

CONCLUSIONS

- LSAF provides a number of features to support better traceability and reporting of the QC process.
- The LSAF APIs enable to read and process information from the LSAF metadata to customize reporting to the QC process needs.
- Users must get used to using versioning and eSigning.
- By creating a manifest report of a specific job, all input and output files of the job can be synchronized to the workspace of the user for further checking and reuse.
- This process enables to get an objective overview of the status of the development and QC activities of a given milestone or study.

